FEDERAL PUBLIC SERVICE COMMISSION
COMPETITIVE EXAMINATION – 2025
FOR RECRUITMENT TO POSTS IN BS-17
UNDER THE FEDERAL GOVERNMENT

Roll Number

Geology

TIME ALLOWED: THREE HOURS	PART-I (MCQS)	MAXIMUM MARKS = 20
PART-I(MCQS): MAXIMUM 30 MINUTES	PART-II	MAXIMUM MARKS = 80

NOTE:

   (i) First attempted **Part-I (MCQS)** on the separate **OMR Answer Book** which shall be taken back after 30 minutes**.**

   (ii) Overwriting/cutting of the **options/answers** will not be given credit.

   (iii) There is no **negative marking**. All **MCQs** must be attempted.

PART-I (MCQs) (COMPULSORY)

Q.1.   **(i)** Select the best option/answer and fill in the appropriate Box on the **OMR Answer Sheet. (20 × 1 = 20)**
     (ii) Answers given anywhere else, other than the OMR Answer Sheet, will not be considered.

1. Statistics deals with:
(A) Individuals
(B) Particular facts
(C) Isolated Items
(D) Aggregative facts

2. The branch of Statistics that deals with procedure and methodology for obtaining valid conclusion is called:
(A) Descriptive
(B) Advance
(C) Inferential
(D) All of these

3. Sum of the absolute deviation is least when deviation is taken from:
(A) Mean
(B) Median
(C) Mode
(D) Geometric Mean

4. In t-distribution, which one is true?
(A) Mean = Median = Mode
(B) Mean > Median > Mode

(C) Mean < Median < Mode
(D) All of these

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5. What is the probability of a sure event?
(A) 1
(B) 0
(C) 0.5
(D) 0.2

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6. Which formula represents the probability of the complement of event A?
(A) 1 + P(A)
(B) 1 - P(A)
(C) P(A)
(D) P(A) - 1

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7. In regression analysis, the variable that is being predicted is:
(A) Dependent variable
(B) Independent variable
(C) Intervening variable
(D) None of these

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8. Paired t-test is applicable when the observations in the two samples are:
(A) Equal in number
(B) Paired
(C) Correlation
(D) All of these

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9. The degree to which numerical data tend to spread about an average is called:
(A) The Dispersion
(B) Regression
(C) Correlation
(D) None of these

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10. The types of estimates are:
(A) Point estimate
(B) Interval estimates
(C) Estimation of confidence region
(D) All of these

11. Ranking scale also includes the properties of _____ scale.
(A) Nominal
(B) Interval
(C) Ratio
(D) All of these

12. The difference between a statistic and the parameter is called:
(A) Sampling error
(B) Random error
(C) Non-random error
(D) Probability

13. The standard deviation of any sampling distribution is called:
(A) Standard error
(B) Non-sampling error
(C) Type-I error
(D) Type-II error

14. A survey conducted by a sampling design is called:
(A) Sample survey
(B) Population survey
(C) Systematic survey
(D) None of these

15. The sum of the frequencies of the frequency distribution of a statistic is equal to:
(A) Sample size
(B) Population size
(C) Possible samples
(D) Sum of X values

16. Sampling error can be reduced by:
(A) Non-probability sampling
(B) Increasing the population
(C) Decreasing the sample size
(D) Increasing the sample size

17. The range of test statistic t is:
(A) 0 to ∞
(B) 0 to 1
(C) $-\infty$ to $+\infty$
(D) -1 to +1

18. The probability associated with committing a Type-I error is:
(A) β
(B) α
(C) 1 – β
(D) 1 – α

19. The degree of freedom for paired t-test based on *n* pairs of observations is:
(A) 2n – 1
(B) n – 2
(C) 2(n – 1)
(D) n – 1

20. Experimental error is due to:
(A) Experimenter's mistakes
(B) Extraneous factors
(C) Variation in treatment effects
(D) None of these

PART-II

NOTE:
    (i) Part-II is to be attempted on the separate **Answer Book.**
    (ii) Attempt **ONLY FOUR** questions from **PART-II. ALL** questions carry **EQUAL** marks.
    (iii) All the parts (if any) of each Question must be attempted at one place instead of at different places.
    (iv) Write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper.
    (v) No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.
    (vi) Extra attempt of any question or any part of the question will not be considered.
    (vii) Use of calculator is allowed.

SECTION-A

Q2. **a)** Discuss the interior of the earth in detail. Also, describe the processes involved in the formation of igneous rocks. **(10)**

    b) What are the laws of superposition and faunal succession? Describe the classification and nomenclature of stratigraphic units in detail. **(10) (20)**

Q3. **a)** What are the main types of sedimentary rocks and how are they formed? also, describe the classification scheme of these sedimentary rocks in detail. **(10)**

    b) Discuss the optical properties of common rock-forming minerals in detail. **(10) (20)**

Q4. Write comprehensive notes on the following topics. **(10) (20)**

    a) Tectonic framework of Pakistan
    b) Geothermal energy resource potentials of Pakistan

SECTION-B

Q5. **a)** Write a detailed note on "geophysical techniques utilized in the exploration of mineral deposits, oil/gas, and groundwater". **(10)**

    b) Discuss migration types in hydrocarbon exploration. Also, describe secondar and enhanced oil recovery techniques in detail. **(10) (20)**

Q6. **a)** What is Walther's law of superposition? Discuss concepts and significance of sequence stratigraphy. **(10)**

    b) Describe the "upper Indus basin with respect to its hydrocarbon potentials" in detail. **(10) (20)**

Q7. What is the role of Engineering Geology in the development of CPEC projects? Explain it with suitable examples. **(20)**

Q8. **a)** Discuss various classification schemes of mineral deposits in detail. **(10)**

    b) Describe various metallic and non-metallic mineral deposits of Pakistan. Also, discuss their significance and abundance in detail. **(10) (20)**